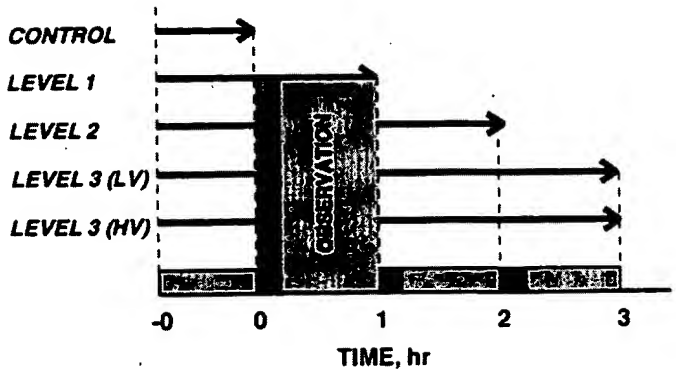
Figure 1


CONTROL
LEVEL 1
LEVEL 2
LEVEL 3 (LV)
LEVEL 3 (HV)
OBSERVATION
-0
0
1
2
3
TIME, hr

5

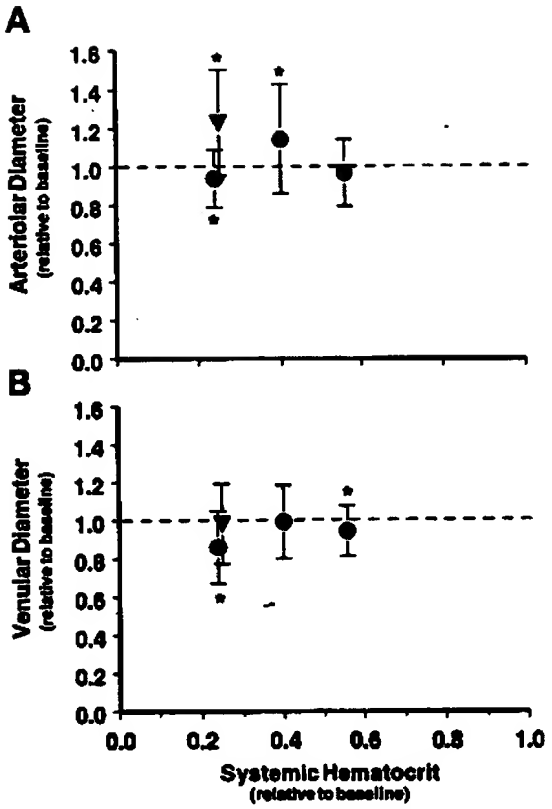


Fig. 2. Vascular tone vs. systemic hematocrit. Data are presented as means ± SD. ●, Dextran 70 exchange; ▼, Dextran 500 exchange. Broken line represents baseline level. *$P < 0.05$. Baseline diameters (μm) in each animal group were as follows: *level 1* [arterioles (A): 62.4 ± 18.2, $n = 44$, venules (V): 68.8 ± 37.5, $n = 42$]; *level 2* (A: 57.9 ± 17.8, $n = 46$, V: 70.9 ± 39.2, $n = 38$); *level 3* LV (A: 58.6 ± 12.3, $n = 49$, V: 78.5 ± 23.9, $n = 37$); *level 3* HV (A: 57.4 ± 15.3, $n = 47$, V: 68.9 ± 32.7 $n = 38$). n, No. of vessels studied.

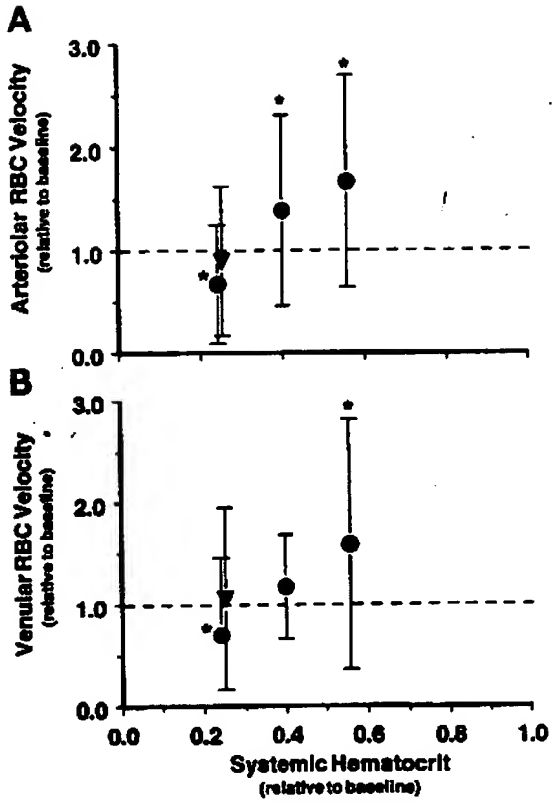


Fig. 3. Arteriolar and venular red blood cell (RBC) velocity vs. systemic hematocrit. Initial increase in arteriolar RBC velocity was followed by a return to baseline with HV protocol, whereas LV protocol led to a reduced RBC velocity. Similar pattern was observed in venular RBC velocity except the return to baseline levels was earlier, occurring after the second exchange. Data are presented as means ± SD. ●, Dextran 70 exchange; ▼, Dextran 500 exchange. Broken line represents baseline level. $*P < 0.05$. Baseline RBC velocities (mm/s) in each animal group were as follows: control (A: 4.9 ± 3.8, V: 1.0 ± 0.7); *level 1* (A: 4.3 ± 2.4, V: 1.2 ± 0.8); *level 2* (A: 4.5 ± 2.5, V: 1.2 ± 1.4); *level 3* LV (A: 4.0 ± 2.3, V: 1.0 ± 0.8); *level 3* HV (A: 4.1 ± 2.7, V: 1.1 ± 0.9).

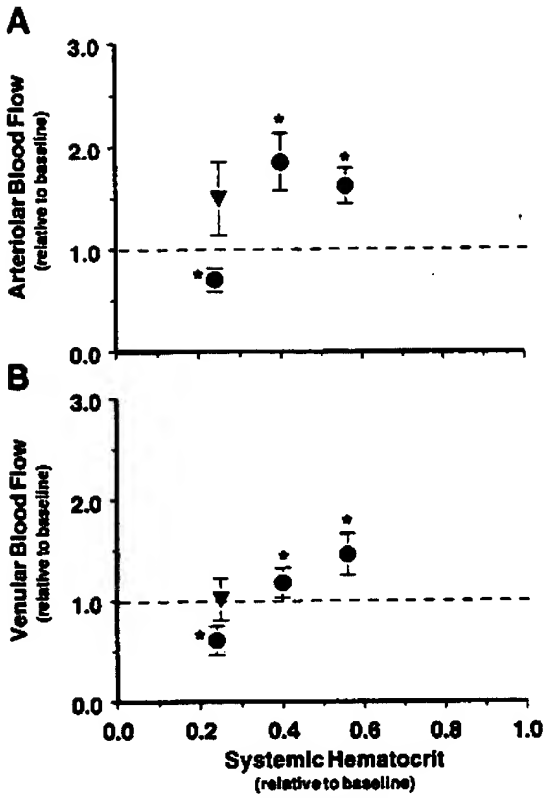


Fig. 4. Arteriolar and venular blood flow vs. systemic hematocrit. Hemodilution led to initial increases in blood flow in both vessel types. At the *level 3* exchange, HV protocol was able to maintain blood flow at baseline levels, whereas LV protocol resulted in reduction. Data are presented as means ± SE relative to baseline levels. ●, Dextran 70 exchange; ▼, Dextran 500 exchange. Broken line represents baseline level. $^*P < 0.05$.

Figure 5

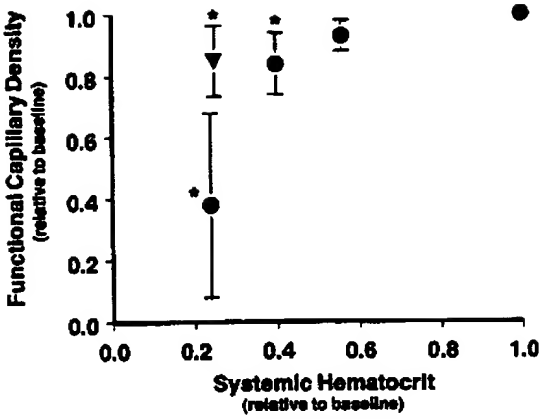


Fig. 5. Effect of hemodilution on capillary perfusion. Functional capillary density (FCD) was unchanged after *level 1* exchange. Drop in FCD was greater after *level 3* LV than *level 3* HV exchange. Data points are means ± SD relative to baseline. ●, Dextran 70 exchange; ▼, Dextran 500 exchange. $^{*}P < 0.05$. Baseline FCD (cm^{-1}) in each experimental group was as follows: *level 1* (105.8 ± 22.1); *level 2* (121.2 ± 20.9); *level 3* LV (109.2 ± 22.2); *level 3* HV (107.6 ± 22.3).

5

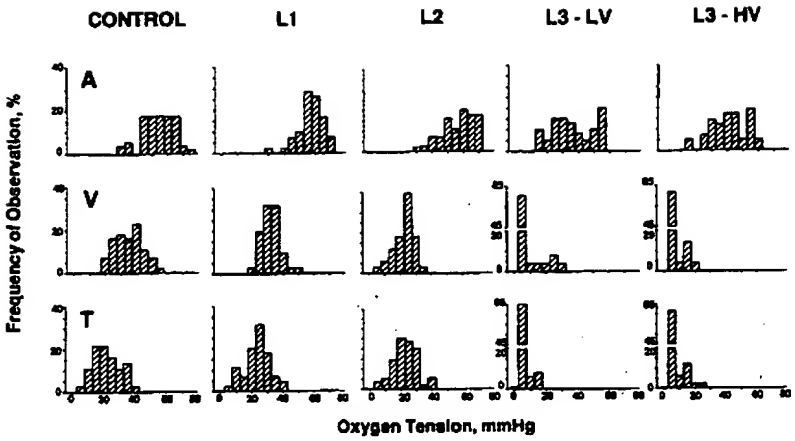


Fig. 6. Distribution of microvascular Po_2 vs. hemodilution level. A, arterioles; V, venules; T, tissue. Shift in arteriolar Po_2 to the right and venular Po_2 shift to the left after *level 1* and *2* exchange maintained tissue oxygenation at baseline levels. *Level 3*, extreme hemodilution, resulted in significant reduction across all categories. Both *level 3* LV and *level 3* HV caused a significant reduction in Po_2 in all categories. Po_2 measurements could only be made in vessels that had blood flow; thus the histograms for *level 3* LV do not include data from 2 animals that did not have blood flow in the tissue under study. Control group vessel diameters (means ± SD, μm) were A: 57.0 ± 18.5 (n = 58), V: 69.9 ± 35.3 (n = 56), and RBC velocities (mm/s) were A: 4.9 ± 3.8 (n = 58), V: 1.0 ± 0.7 (n = 56). n, No. of vessels studied.